

WHAT IS CLAIMED IS:

1. An exposure apparatus that illuminates a pattern on an original form, introduces light from the pattern to a plate, and exposes the plate, said exposure apparatus comprising:

at least one optical element; and
at least one forcing member that applies a force to the at least one optical element in a non-contact manner.

2. An exposure apparatus according to claim 1, wherein said forcing member reduces a gravity deformation amount of the at least one optical element by applying the force to the at least one optical element.

3. An exposure apparatus according to claim 1, wherein said forcing member uses a permanent magnet, an electromagnet, a Lorentz force, an electrostatic force or a combination thereof.

4. An exposure apparatus according to claim 1, further comprising:
a wave front aberration measuring unit for measuring wave front aberration of a projection optical system that includes at least one optical element; and

a controller for controlling said forcing member based on a measurement result of said wave front aberration measuring unit.

5 5. An exposure apparatus according to claim 4, wherein said controller calculates a correction amount to the gravity deformation of the at least one optical element and controls said forcing member based on the measurement result.

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6. An exposure apparatus according to claim 4, further comprising a plate driving stage for driving the stage, wherein said wave front aberration measuring unit is provided on the plate driving stage.

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7. An exposure apparatus according to claim 1, further comprising a position adjusting unit for adjusting a position of the at least one optical element in a non-contact manner.

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8. An exposure apparatus according to claim 7, wherein said position adjusting unit uses a permanent magnet, an electromagnet, a Lorentz force, an electrostatic force or a combination thereof.

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9. An exposure apparatus according to claim 7, further comprising:

a wave front aberration measuring unit for measuring wave front aberration of a projection optical system that includes at least one optical element; and
a controller for controlling said position
5 adjusting unit based on a measurement result of said wave front aberration measuring unit.

10. An exposure apparatus according to claim 9, wherein said controller calculates a correction amount
10 to the gravity deformation of the at least one optical element and controls said position adjusting unit based on the measurement result.

11. An exposure apparatus according to claim 9,
15 further comprising a plate driving stage for driving the stage, wherein said wave front aberration measuring unit is provided on the plate driving stage.

12. An exposure apparatus according to claim 1,
20 further comprising:

an illumination optical system for illuminating the pattern on the original form; and

a projection optical system for introducing the light from the pattern to the plate, wherein the at
25 least one optical element is arranged in said illumination and/or projection optical systems.

13. An exposure apparatus according to claim 1,
wherein the at least one optical element is a
reflective member for reflecting light used for the
exposure apparatus.

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14. An exposure apparatus according to claim 1,
wherein the light from the pattern has a wavelength
between 13 and 14 nm.

10 15. An exposure apparatus according to claim 15,
further comprising a temperature sensor for measuring
temperature of the at least one optical element, and
the force applied by said forcing unit to the at least
one optical element is determined by an output of said
15 temperature sensor.

16. A device fabrication method comprising the
steps of:

exposing a plate using an exposure apparatus
20 according to claim 1; and
developing the plate that has been exposed.